

## SPECIFICATION

### WASHER

#### 5   **Technical field**

The present invention relates to a washer that is capable of sterilizing laundry and each portion of a washer such as a washing tub and the like by using metal ions exerting a sterilizing effect. Especially, it relates to a washer furnished with an ion eluting unit that produces metal ions by applying a voltage between electrodes.

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#### **Background art**

When laundry is washed in a washer, it is common to add a treatment substance to water, in particular, to rinsing water. Typical examples of such treatment substances include softening and starching agents. In addition to these, in recent years, the demand has been

15   increasing for treatment whereby laundry is subjected to antimicrobial treatment.

From the hygienic point of view, it is desirable to hang laundry in the sun to dry. However, in recent years, with the increase in the number of women who go to work, and with the increase in the number of nuclear families, there have been an increasing number of households where no one is at home in the daytime. In these households, there is no choice

20   but to hang laundry indoors to dry. Even in households where someone is at home in the daytime, in a rainy weather, there is no choice but to hang laundry indoors to dry.

As compared with hanging laundry in the sun to dry, hanging it indoors tends to promote growth of bacteria and mold in laundry. This tendency is marked particularly when it takes time to dry laundry, as when humidity is high, such as in a rainy season, or when

uneven spreading of laundry is detected during rotation of a washing tub for squeezing after metal ions are added.

In order to achieve the above object, according to the present invention, a washer, wherein antimicrobial metal ions can be added into water in a predetermined process in a laundry washing session, is so configured that a time of the predetermined process is longer when metal ions are added than when no metal ions are added. It requires certain amount of time for the metal ions to fully attach to laundry. With this configuration, when the metal ions are added, the processing time is extended compared with the case where no metal ions are added, leading to satisfactory attachment of metal ions to laundry and exertion of their expected antimicrobial effect.

According to the present invention, in the washer configured as described above, metal ions can be added into water being fed during "rinsing with pouring water." In case where rinsing is performed while pouring water, there is a possibility that a concentration of the metal ions which have been added decreases. With this configuration, during the "rinsing with pouring water," a concentration of the metal ions in the water does not decrease, and necessary amount of the metal ions is attached to laundry.

According to the present invention, a washer, wherein antimicrobial metal ions can be added into water in a predetermined process in a laundry washing session, is so configured that the predetermined process includes a powerful swirl period and a mild swirl period or a powerful swirl period and a still period. It is not always necessary to agitate water strongly in order to make the metal ions attached to laundry. With this configuration, aside from the powerful swirl period, the purpose of which is to make metal ions be dispersed uniformly into water and spread to every corner of laundry, there is a mild swirl period or a still period, the purpose of which is to quietly wait for attachment of metal ions to laundry, it is possible to

avoid damages to the laundry cloth or increase in electricity consumption. Additionally, generation of a mild swirl, rather than a still state, makes users notice that the washer is in operation, not malfunction.

According to the present invention, in the washer configured as described above, a  
5 ratio of powerful swirl period and mild swirl period or a ratio of powerful swirl period and still period is constant, regardless of a volume of water in a washing tub and/or an amount of laundry. With this configuration, programming of control program is easy.

According to the present invention, in the washer configured as described above, a  
10 ratio of powerful swirl period and mild swirl period or a ratio of powerful swirl period and still period varies in accordance with a volume of water in a washing tub and/or an amount of laundry. With this configuration, it is possible to set the ratio of powerful swirl period and mild swirl period or the ratio of powerful swirl period and still period appropriately in accordance with the volume of water or the amount of laundry, thereby damage to laundry cloth is alleviated and unnecessary electricity consumption is avoided.

15 According to the present invention, a washer, wherein antimicrobial metal ions can be added into water in a predetermined process in a laundry washing session, is so configured that when uneven spreading of laundry is detected during squeezing rotation of a washing tub after addition of metal ions, a countermeasure to be adapted is different from that when such uneven spreading of laundry is detected while no metal ions are added. With this  
20 configuration, when uneven spreading of laundry is detected while rotating for squeezing after the metal ions are added, it is possible to correct uneven spreading of laundry, taking the antimicrobial effect of the metal ions into consideration.

According to the present invention, in the washer configured as described above, the different countermeasure is rinsing for correcting uneven spreading of laundry by agitating

it in water containing metal ions. With this configuration, in case where the rinsing for

## CLAIMS

1. A washer wherein antimicrobial metal ions can be added in to water in a predetermined process in a laundry washing session,

5 wherein a time of the predetermined process is longer when metal ions are added than when no metal ions are added.

2. (Amended) The washer according to claim 1,  
wherein metal ions can be added into water being fed during “rinsing with pouring  
10 water.”

3. (Amended) A washer wherein antimicrobial metal ions can be added in to  
water in a predetermined process in a laundry washing session,  
wherein the predetermined process includes a powerful swirl period and a mild  
15 swirl period or a powerful swirl period and a still period.

4. (Amended) The washer according to claim 3,  
wherein a ratio of powerful swirl period and mild swirl period or a ratio of  
powerful swirl period and still period is constant, regardless of a volume of water in a  
20 washing tub and/or an amount of laundry.

5. (Amended) The washer according to claim 3,  
wherein a ratio of powerful swirl period and mild swirl period or a ratio of  
powerful swirl period and still period varies in accordance with a volume of water in a

washing tub and/or an amount of laundry.

6. A washer wherein antimicrobial metal ions can be added in to water in a predetermined process in a laundry washing session,

5 wherein when uneven spreading of laundry is detected during squeezing rotation of a washing tub after addition of metal ions, a countermeasure to be adapted is different from that when uneven spreading of laundry is detected while no metal ions are added.

7. The washer according to claim 6,

10 wherein the different countermeasure is rinsing for correcting uneven spreading of laundry by agitating it in water containing metal ions.

8. The washer according to claim 7,

15 wherein in case where the rinsing for correcting uneven spreading of laundry is executed with fresh water being replenished, an amount of metal ions to be added is less than that added in previous processes.

9. The washer according to claim 6,

20 wherein the different countermeasure is rinsing for correcting uneven spreading of laundry by agitating it in water containing no metal ions with indication and/or notification that water being fed contains no metal ions.

10. The washer according to claim 6,

wherein the different countermeasure is termination of squeezing rotation together